

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2005/000406

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7): B01J 29/00, B01J 37/04, B01J 35/02, B01J 20/10, B01J 20/28, B01J 35/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(7) B01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC 252

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Canadian Patent Database, Delphion and USPTO.
Goggle with search terms "Periodic mesoporous organosilicas" or "hybrid mesoporous organosilicas".

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,248,686 (INAGAKI et al) 19 June 2001, (19-06-2001) col. 2, lines 6 to 10, 22 to 28 and 46 to 53; col. 5, lines 35 to 39; col. 5 line 61 to col. 6, line 16; col. 8, lines 32 to 46; col. 10, line 11 to col. 11, line 53 and claims.	2, 3, 6 to 9, 12, 14 to 30, 33, 34, 37 to 40, 43 and 45 to 61.
A	CA 2,440,990 (MEHDI et al) 03 October 2002, (03-10-2002) whole document.	
A	US 6,696,538 (KO et al) 24 February 2004, (24-02-2004) whole document.	
A	"Periodic mesoporous organosilicas with organic groups inside the channel walls" Nature, Vol. 402, Issue 6764, pp.867-871 (1999), Asefa et al.	
A	"Novel Bifunctional Periodic Mesoporous Organosilicas, BPMOs" J Am Chem Soc. 2001 Sep 5; 123(35):8520-30, Asefa et al.	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search

27 June 2005 (27-06-2005)

Date of mailing of the international search report

28 July 2005 (28-07-2005)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☐ Claim Nos.
because they relate to subject matter not required to be searched by this Authority, namely :

2. ☒ Claim Nos. 1, 14 to 30 (partly - when they refer to claim 1), 31, 32 and 45 to 61 (partly - when they refer to claims 31 or 32)
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :

These claims relate to an extremely large number of possible hybrid materials and methods of synthesizing these hybrid materials. In fact the claims contain so many options that a lack of clarity within the meaning of Art. 6 PCT arises to such an extent as to render a meaningful search of these claims impossible. Consequently, the search has been carried out for those parts of the application which do appear to be supported clearly, namely metaloxide and organometaloxide material framework which are recited in the examples and the general description.

3. ☐ Claim Nos.
because they are dependant claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. :

- Remark on Protest** ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Highly Stable Mesoporous Metal Oxides Using Nano-Propping Hybrid Gemini Surfactants", J Am Chem Soc. 2004, 126, 2310-2311, Lyu et al.	

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Information on patent family members

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Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US6248686	19-06-2001	DE19930944 A1	05-01-2000
		JP2000017102 A	18-01-2000
		JP2000219770 A	08-08-2000
CA2440990	03-10-2002	EP1370563 A1	17-12-2003
		FR2822470 A1	27-09-2002
		JP2004536043T T	02-12-2004
		US2004122250 A1	24-06-2004
		WO02076991 A1	03-10-2002
US6696538	24-02-2004	JP2001253945 A	18-09-2001
		KR2001007440 A	07-12-2001
		US2004038048 A1	26-02-2004